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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/638,174	08/07/2003	Dale W. Schroeder	10004207-1	3783

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EXAMINER

STEIN, JAMES D

ART UNIT PAPER NUMBER

2874

DATE MAILED: 06/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/638,174

Applicant(s)

SCHROEDER, DALE W.

Examiner

James D. Stein

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05-02-05.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-12 and 15-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-12 and 15-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office Action is in response to the amendment filed on 5/02/05, which has been fully considered and entered into the prosecution record. Claims 1, 3, 4, 7-9, 11, 12 and 16-19 have been amended. Claims 5, 6, 13, 14, and 20 have been cancelled. Claims 1-4, 7-12 and 15-19 are pending in the application.

#### ***Response to Arguments***

Applicant's arguments filed 5/02/05 have been fully considered but they are not persuasive. Applicant has argued that the Vaganov reference cited in the previous Office Action does not teach the actuators to apply one or more forces directly to the optical fibers and has amended claims 1, 3, 4, 7, and 16-18 accordingly to recite this limitation. The Examiner notes that Vaganov *repeatedly* teaches the actuators to apply a force directly to the optical fibers (see paragraphs 0083, 0116, 0138, and 0144). Moreover, as was discussed in the previous Office Action, Vaganov teaches the *optical fibers are bent* by the actuators (see paragraphs 0020, 0154, 0156 and 0158) in order to direct the light beams. The Examiner notes that in order to *bend* an object a force *must* be applied directly to it in some manner; therefore, forces are inherently applied directly to the optical fibers, as claimed by applicant. For these reasons, the rejections set forth in the previous Office Action are maintained.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 7-12 and 15-19 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by [USPUB 20020181843] to Vaganov.

With regard to claims 1, 7, and 16, Vaganov discloses a MEMS optical switch. Fig. 4 shows input optical fibers 12 for receiving beams of light and output optical fibers 26. Fig. 5 shows a first array of support devices 32 connected to said input optical fibers 12 for creating bends in said fibers. Also, a second array of support devices 36 is shown connected to said output optical fibers 26 for creating a bend in said output optical fibers 26. Furthermore, Vaganov teaches bends in said input and output optical fibers to direct the beams of light from the input optical fibers 12 to said output optical fibers 26: "At least a portion of the distal ends of the optical fibers move in three orthogonal and at least two angular dimensions to direct output beams from the plurality of transmitting devices to the plurality of receiving devices [0040]." It is noted to applicant that "transmitting devices" comprises input optical fibers while "receiving devices" comprises output optical fibers. Fig. 5 clearly shows bends in the input 12 and output 26 optical fibers and said beams of light being directed from input optical fibers 12 to output optical fibers 26. Furthermore, the method of directing a beam of light regarding claim 16 is inherent to this disclosure.

With regard to claims 2, and 15 in addition to the rejection of claim 1 previously discussed above, Fig. 2 shows a mirror 16 for receiving the beam of light from input optical fiber 12 and reflecting the beam to the output optical fiber 26.

With regard to claims 3, 8 and 17, in addition to the rejection of claim 1 previously discussed above, Figs. 21 A and B show an actuator device which is associated with each of the plurality of optical fibers 12, each mounted on array of support devices 32 used to create various directional bends in optical fibers 60. Among other detail, the teaching in paragraph [0140] indicates that a voltage applied on electrodes 174 and 176 will generate a force and cause a first actuator 190 to bend fiber toward the +Y direction. It is also taught that a voltage applied on electrodes 180 and 182 will generate a force and cause a second actuator 194 to bend the fiber in the -Y direction. Therefore, one can infer that a voltage applied on electrodes 177 and 178 will generate a force and cause actuator 192 to bend the fiber in the +X direction. This teaching anticipates applicants claim because first actuator 190 in a first pair of actuators 190 and 192 causes a force along an axis (+Y) to bend the input fiber 60, which is perpendicular to axis (+X) along which a force is generated by said second actuator 192 in first pair of actuators 190 and 192 to create a bend in the input optical fiber. Furthermore, the method of directing a beam of light regarding claim 17 is inherent to this disclosure.

With regard to claims 4, 9 and 18, in addition to the rejection of claim 3 discussed above, Fig. 3 shows identical structure for both first 32 and second 34 array of support devices (same construction for input and output devices). Furthermore, Vaganov teaches, "FIG. 3 illustrates one embodiment of an optical switch 30 of the present invention. The FIG. 3 embodiment includes five major components, a transmitting unit, hereafter a "transmitting array" 32, an optical transparent media 34, a receiving unit, hereafter a "receiving array" 36, a control system 38 and a packaging 40. Transmitting and receiving arrays 32 and 36 each include an optical body 42, a fiber connector 44, a cavity 46, a lens 48, a focusing device 50 and a transmitting directing

device 54 [0080].” Therefore it is inherent that Figs. 21 A and B also show an actuator device which is associated which is associated with each of the plurality of optical fibers 26, each mounted on said second array of support devices 36 used to create various directional bends in optical fibers 60. Among other detail, the teaching in paragraph [0140] indicates that a voltage applied on electrodes 186 and 184 will generate a force and cause a third actuator 196 to bend fiber toward the -X direction, and that a voltage applied on electrodes 182 and 180 will generate a force and cause a fourth actuator 194 to bend the fiber in the -Y direction. This teaching anticipates applicants claim because said third actuator 196 in a said second pair of actuators 196 and 194 causes a force along an axis (-X) to bend the output optical fiber, which is perpendicular to an axis (-Y) along which a force is generated by said second actuator 194 in first pair of actuators 196 and 194 to bend the output optical fiber. Furthermore, the method of directing a beam of light regarding claim 18 is inherent to this disclosure.

With regard to claim 10, in addition to the rejection of claim 9 previously discussed above, Fig. 21A shows a first plurality of bands (174-186) of material surrounding the input optical fibers 12 (Fig. 3). This structure is associated with each of the input optical fibers 12 within said first array of support devices 32. This feature is illustrated clearly by the side cross-sectional view of Fig. 21B.

As discussed above, since the construction is identical for both input 32 and output 36 arrays, Fig. 21A also implies a *second* plurality of bands (174-186) of material surrounding the input optical fibers 26 (Fig. 3). This structure is associated with each of the input optical fibers 26 within said second array of support devices 36. This feature is illustrated clearly by the side cross-sectional view of Fig. 21B.

With regard to claim 11, in addition to the rejection of claim 10 discussed above, as discussed above, a voltage applied between bands 174 and 176, and bands 177 and 178 create a force between said bands and said first pair of actuators 190 and 192 so as to cause impart a bend in said input fibers 12. Vaganov teaches the force between electrode bands and actuators to cause fiber bending: “When a voltage is applied to plates 174 or 178 the electrostatic force attracts corresponding parts of moveable member 172. This results in a change of the angle or position of fiber 60 and beam 196 to create the required tilt or angle of the outgoing light beam [0137].” This disclosure anticipates the applicant’s claim.

With regard to claim 12, since the construction is identical for both input 32 and output 36 arrays, the discussion above regarding claim 11 implies that a voltage applied between bands 180 and 182, and bands 184 and 186 create a force between said bands and said second pair of actuators 194 and 196 so as to cause impart a bend in said output fibers 12. Vaganov teaches the force between electrode bands and actuators to cause fiber bending: “When a voltage is applied to plates 174 or 178 the electrostatic force attracts corresponding parts of moveable member 172. This results in a change of the angle or position of fiber 60 and beam 196 to create the required tilt or angle of the outgoing light beam [0137].” This disclosure anticipates applicants claim.

With regard to claim 19, the method of directing a beam of light is inherent to the disclosed apparatus described above in the rejections of claims 10-12. For clarity, it is noted to applicant that the “first pair of actuators” and “second pair of actuators” of claims 11 and 12, comprise the “first and second actuators” and “third and fourth actuators” of claim 19, respectively.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James D. Stein whose telephone number is (571) 272-2132. The examiner can normally be reached on M-F (8:00am-4:30pm).

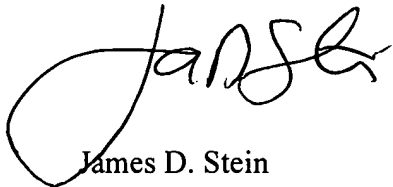
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

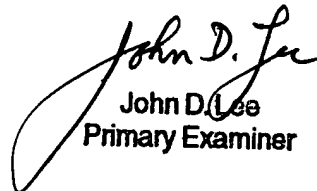


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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "James D. Stein".

James D. Stein

A handwritten signature in black ink, appearing to read "John D. Lee".

John D. Lee  
Primary Examiner